Section 1 Newton's First Law: A Running Start (p. 132) 12/06/16

WDYS I see a field, which seems to be used as a soccer field. I see 5 people in the field, and four of them are playing with a soccer ball. I also see two animals playing with a soccer ball. One guy looks like he ran, and kicked the ball far , that even the guy standing in front of the goalie looked back to see it. Another guy seems to have kicked the ball but it did not go very far up, so it went back down. A ladybug is pushing a soccer ball, and a mouse is kicking another soccer ball. Children playing soccer, one kid is running fast to kick the ball and went over the soccer net. Another kid kicked a ball standing still kicked the ball and it went up and straight down. There is a mouse and a bug pushing balls and two people on the back kicking soccer balls. There is a ground hog and a boy standing in front of the goalie net looking at the ball that flew over him.

WDYT A soccer [ball] continues to roll across the field after you kick it because that is it's braking distance. Like the experiment with the toy car the force of the kick causes the ball to move and it has to go a certain distance before it comes to a complete stop.

Section 1 Newton's First Law: A Running Start (p. 132)

IWBAT

- describe Galileo's law of motion
- apply Newton's first law of motion
- recognize inertial mass as a property of matter
- explain that speed depends on frame of reference.

Via

- Participating in collaborative experiments
- Team and whole class discussions to clarify key concepts
- Collaboratively answering questions targeting key concepts

Section 1 Newton's First Law: A Running Start (p. 132)

Investigate

Hold the ramp by placing no more than two fingers at each end and pressing the ends gently toward the center to cause a gentle bend.

Section 1 Newton's First Law: A Running Start

Physics Talk (p. 134)

inertia (in er sha) - the natural tendency of an object to resist motion or to continue moving in a straight line at the same speed

force - a push or a pull

Newton's 1st law of motion - in the absence of an unbalanced force, an object will remain at rest or an object in motion will remain in motion with a constant speed in a straight line

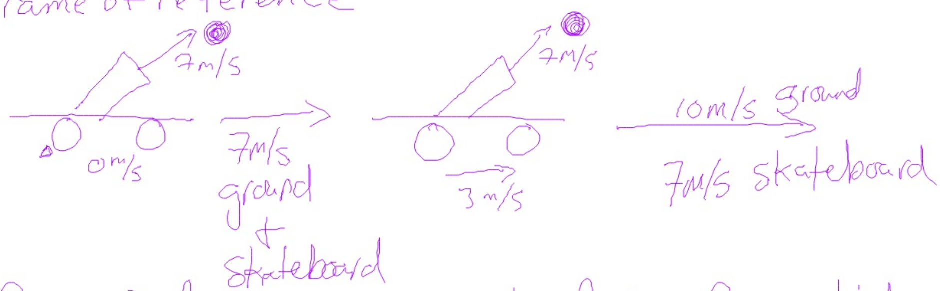
Two objects moving the same speed, the one with the greater mass has the greater inertia

Section 1 Newton's First Law:
A Running Start
Physics Talk (p. 134)

Mass (kg) kilo = 1,000 1 kg ≈ 2.2 lb

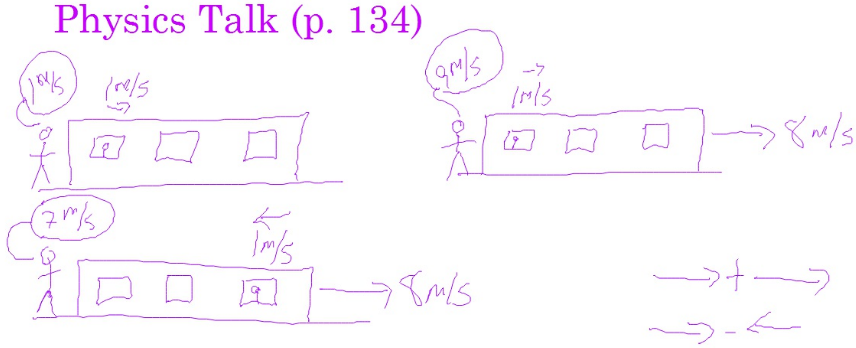
The velocity of a thrown object depends on the velocity of the hand, elbow, shoulder, and body.

Frame of reference



Frame of reference - the point of view from which we observe or measure movement

Section 1 Newton's First Law:
A Running Start
Physics Talk (p. 134)



Section 1 Newton's First Law: A Running Start

Complete:
Checking Up (p. 138) #1, 2, 5, 6
Physics to Go (pp. 143-144) #1-4, 10
WDYTN (p. 141)

Section 2 Constant Speed and Acceleration: Measuring Motion

p. 145

12/09/16

WDYS I see two pictures. In the top picture, I see a guy who seems to be walking slow, and his footsteps seem to be really close together. In the bottom picture, the guy seems to be running with a bouquet of flowers in his hands. In the picture his footsteps are further apart. The top picture the kid is walking at a slow pace. His footprints are closer together, The dog is walking slowly and there is a snail moving faster than both the dog and kid.The bottom picture the kid is running and his foot steps are further apart he is chasing the dog that is running. In the top picture he has a Z in his thought bubble for sleepy and the bottom thought bubble is a heart.

WDYT The meaning of 100 mi/h and 45m/s is the speed the baseball is traveling using the 45m/s measurement and the distance from the pitcher diamond to the batter is 90ft we know the ball will reach the pitcher in 2.47s

Section 2 Constant Speed and Acceleration: Measuring Motion

IWBAT
- give examples of distance, time, speed, and acceleration
- differentiate between instantaneous and average speed
- recognize when motion is accelerated
- calculate average speed and acceleration.

Via
- Participating in collaborative experiments
- Team and whole class discussions to clarify key concepts
- Collaboratively answering questions targeting key concepts

Section 2 Constant Speed and Acceleration: Measuring Motion

p. 145

Investigate:
- One set of tapes and graphs per team
- Please use graph paper to set up your graphs
- Each dot is placed every 1/60th of a second ... 60 dots are drawn each second

Homework:
Find 3 examples of Newton's First Law of Motion (or Galileo's Law of Inertia) in sports (Olympic or otherwise). Be prepared to share out on Monday.

Section 2 Constant Speed and Acceleration: Measuring Motion

Physics Talk (p. 148)

Section 2 Constant Speed and Acceleration: Measuring Motion

Complete:
Checking Up (p. 151) #1-4
Physics to Go (pp. 154-156) #2, 3, 7, & 11
WDYTN

Section 3 Newton's Second Law: Push or Pull   p. 157   12/13/16

WDYS I see a dog, mountains, grass, a person with a stick pushing a blue ball, a dog in a red car, and a dog running along the person. I see a boy slowly pushing a ball with a stick, then he starts to speed up while still pushing the ball and then he starts to run but he looks as if he is going to fall. The dog is just enjoying his walk but then he starts to run while looking exhausted so instead of running or walking he decides to take a drive in his red car.

WDYT The weight of a tennis ball is less than a bowling ball, the materials for a tennis ball are also lighter than a bowling ball, the tennis ball will likely move further and faster than the bowling ball the bowling ball would also have to start and move on the ground where the tennis ball will be able to move through the air A force is a way to get things moving by forcing it to go like the lady in the picture when she is moving, pushing the ball with the stick; she is forcing the ball to go forward. When someone is forcing a tennis ball with the same amount that they force a bowling ball, the tennis ball will go faster and be easier to push, but the bowling ball will be slower because of the weight it carries.

Section 3 Newton's Second Law: Push or Pull   12/13/16

IWBAT
- identify the forces on an object
- determine when forces on an object are either balanced or unbalanced
- compare amounts of acceleration semi-quantitatively
- apply the definition of the Newton as a unit of force
- describe weight as the force due to gravity.

Via
- Participating in collaborative experiments
- Team and whole class discussions to clarify key concepts
- Collaboratively answering questions targeting key concepts

Section 3 Newton's Second Law: Push or Pull

p. 157

Investigate:

Your items to push include:

- cart
- plastic bottle
- weighted cart

There are four pennies per group for steps 8 & 9.

Quantitative – quantities – stuff you can measure

Qualitative - using your senses

Section 3 Newton's Second Law: Push or Pull

Evidence for Newton's Second Law of Motion (p. 160)

The acceleration of an object is directly proportional to the unbalanced force acting upon it. larger force means large acceleration. Smaller force smaller acceleration. The larger the mass the smaller the acceleration. The change in the motion is proportional to the motive force impressed

Section 3 Newton's Second Law: Push or Pull

An Equation for Newton's Second law of Motion (p. 161)

- $F = m \times a$
- $a = F \div m$
- $m = F \div a$

F = force (newtons)

m = mass (kilograms)

a = accelerations (meters per second^2)

Section 3 Newton's Second Law: Push or Pull

Newton: A Derived SI Unit with a Special Name (pp. 161-162)

$$1 kg \cdot m/s^2 = 1 kg \cdot \frac{m}{s^2} \text{ or } 1 kg \cdot \frac{m}{s \cdot s}$$

Derived units are made from other units

Section 3 Newton's Second Law: Push or Pull

Where There's Acceleration, There Must be an Unbalanced Force (p. 162)

Acceleration is caused by a unbalanced force, the Same force will cause a Smaller mass object to move further than a larger mass object

Any Force causes acceleration, Even if it is a very small measurment of acceleration.

Section 3 Newton's Second Law: Push or Pull

Calculations and Units (p. 163) & Using Measurements in Calculations (p. 164)

Always use units, and pay attention to them.

When performing calculations using measurements you need to express the result of your calculations in a way that makes sense of the precision of the measurement used. The number of significant figures represent how carefully and with what level of accuracy or precision, the measurement was taken. A calculation will never add significant figures, but they can reduce the number.

Section 3 Newton's Second Law: Push or Pull

Determining the Number of Significant Figures in a Measurement (p. 165)

Significant Figures. Zeros can significant or insignificant depending on their place. The numbers above the decimals are significant. Zeros before the decimal point are not significant

Ex. 308 g, Zero is significant & there are three significant figures

Section 3 Newton's Second Law: Push or Pull

Gravity, Mass, Weight, and Newton's Second Law (p. 166)

Newtons second law informs you that if there is an acceleration, there must be an unbalanced force acting

Weight is the force of gravity acting on an object, and it depends on the mass of the object and the acceleration due to gravity.

$F_{gravity} = ma_{gravity}$

$w = mg$

w = weight

m = mass in Kg

g = acceleration due to gravity (9.8 m/s²)

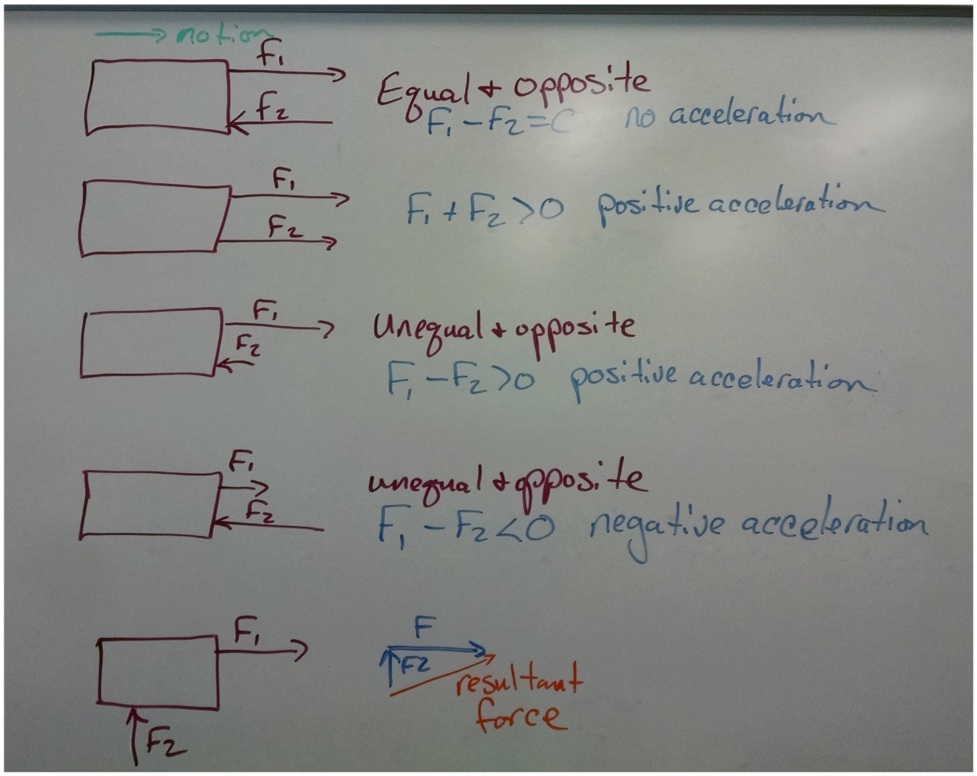
Section 3 Newton's Second Law:
Push or Pull

Balanced and Unbalanced Forces (p. 167)

When 2 forces act at the same time the direction as well as the magnitude of the forces determine the motion of the object

Section 3 Newton's Second Law: Push or Pull

Balanced and Unbalanced Forces (p. 167)



Section 3 Newton's Second Law: Push or Pull

Adding vectors (p . 168)

→ → Same direction: add

→ ← opposite direction: subtract

4N → 2N → 6N to the right

6N → 2N ← 4N to the right

direction determined by larger force

Section 3 Newton's Second Law: Push or Pull   p. 157

Complete:
Checking Up (p. 167) #1-4
Physics to Go (pp. 172-173) #3, 4, 10, 12, & 15
WDYTN

Section 4 Projectile Motion: Launching Things into the Air   p. 174   12/19/16

WDYS I see a red and green apple, the green one is being thrown and the red one is being dropped. I see two people, one timing the apples and one dropping/throwing the apple, a ladder and wooden floor. There is also a white cat and a dog that is brown with white spots.There is a two headed boy recording time while a girl on a ladder throwing green and red apples at the dog and cat I think

WDYT I think friction, force, and newtons second law determines how far an object thrown into the air travels [before] landing

Section 4 Projectile Motion: p. 174
Launching Things into the Air

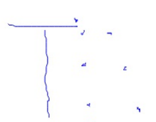
IWBAT
- apply the terms free fall, projectile, trajectory, and range
- provide evidence concerning projectiles launched horizontally at different speeds
- explain the relationship between the vertical and horizontal components of a projectile's motion
- recognize the factors that affect the range of a projectile
- infer the shape of a projectile's trajectory.

Via
- Participating in collaborative experiments
- Team and whole class discussions to clarify key concepts
- Collaboratively answering questions targeting key concepts

Section 4 Projectile Motion: p. 174
Launching Things into the Air

Investigate

Part A
#2: You will only use your fingers to move the coin.
#4: Use physics text books to change the height of the launch



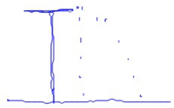
IWBAT apply the terms free fall, projectile, trajectory, and range; provide evidence concerning projectiles launched horizontally at different speeds; explain the relationship between the vertical and horizontal components of a projectile's motion; recognize the factors that affect the range of a projectile; and infer the shape of a projectile's trajectory.

Section 4 Projectile Motion: Launching Things into the Air p. 174

Physics Talk (p. 177)

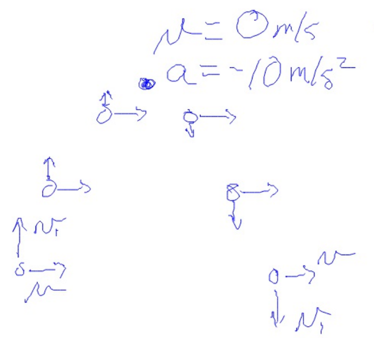
Air resistance can slow an object's fall

The horizontal motion of a projectile does not affect its downward motion



$a_g = 9.8\ m/s^2 \approx 10\ m/s^2$

$v \uparrow (+)\quad v \downarrow (-)$



IWBAT apply the terms free fall, projectile, trajectory, and range; provide evidence concerning projectiles launched horizontally at different speeds; explain the relationship between the vertical and horizontal components of a projectile's motion; recognize the factors that affect the range of a projectile; and infer the shape of a projectile's trajectory.

Section 4 Projectile Motion: p. 174
Launching Things into the Air

IWBAT apply the terms free fall, projectile, trajectory, and range; provide evidence concerning projectiles launched horizontally at different speeds; explain the relationship between the vertical and horizontal components of a projectile's motion; recognize the factors that affect the range of a projectile; and infer the shape of a projectile's trajectory.

Section 4 Projectile Motion: Launching Things into the Air

p. 174

Complete:
Checking Up (p. 178) #1-3
Physics to Go (pp. 182-183) #5, 6, & 7
WDYTN

IWBAT apply the terms free fall, projectile, trajectory, and range; provide evidence concerning projectiles launched horizontally at different speeds; explain the relationship between the vertical and horizontal components of a projectile's motion; recognize the factors that affect the range of a projectile; and infer the shape of a projectile's trajectory.

Section 5 The Range of Projectiles: The Shot Put

p. 184

12/21/16

WDYS I see a soccer ball,four people, a dog, score board, wall/fence, grass and a goal post. Them playing soccer and the ball bounced off of the kid and made a goal A girl kicking a soccer ball up in the air and a kid bouncing the ball back up towards the net, a kid diving into the net trying to catch the ball, a kid running towards the other players a dog and a home vs. visitors sign that says y1 x2 for HOME and Y2 0.1X2 for VISITORS

WDYT The more vertical the angle is the straighter up and down the trajectory of the projectile will be and it will have a shorter distance, the more horizontal the angle becomes the longer the distance will be

I believe the more increased the speed is the further the projectile will travel

Section 5 The Range of Projectiles: The Shot Put

p. 184

IWBAT

- measure the acceleration due to gravity
- calculate the speed attained by an object that has fallen freely from rest
- identify the relationship between the average speed of an object that has fallen freely from rest and the final speed attained by the object
- calculate the distance traveled by an object that has fallen freely from rest
- use the mathematical models of free fall and uniform speed to construct a physical model of the trajectory of a projectile
- use the motion of a real projectile to test a physical model of projectile motion
- use a physical model of projectile motion to infer the effects of launch speed and launch angle on the range of a projectile.

Via

- Participating in collaborative experiments
- Team and whole class discussions to clarify key concepts
- Collaboratively answering questions targeting key concepts

Section 5 The Range of Projectiles: The Shot Put

p. 184

Investigate

Step 1: We will use the second method: tickertape timer with a weight.

Steps 3 & 4: Mass w/ strings already assembled.

Steps 5-11: Class as one group

IWBAT measure the acceleration due to gravity, calculate the speed attained by an object that has fallen freely from rest, identify the relationship between the average speed of an object that has fallen freely from rest and the final speed attained by the object, calculate the distance traveled by an object that has fallen freely from rest, use the mathematical models of free fall and uniform speed to construct a physical model of the trajectory of a projectile, use the motion of a real projectile to test a physical model of projectile motion, and use a physical model of projectile motion to infer the effects of launch speed and launch angle on the range of a projectile.

Section 5 The Range of Projectiles: The Shot Put p. 184

Physics Talk (p. 188) Model

There are two different motions for a projectiles,
1) Constant speed along a straight line determined by launch speed & direction
2) downward acceleration due to gravity

The trajectory of a projectile can be modeled by graph, on a computer, or a physical model

the trajectory of a projectile is a parabola if we ignore air resistance

Section 5 The Range of Projectiles: The Shot Put p. 184

Complete:
Checking Up (p. 189) #1-3
Physics to Go (pp. 194-195) #1, 2, 3, 4, 6, & 8
WDYTN

IWBAT measure the acceleration due to gravity, calculate the speed attained by an object that has fallen freely from rest, identify the relationship between the average speed of an object that has fallen freely from rest and the final speed attained by the object, calculate the distance traveled by an object that has fallen freely from rest, use the mathematical models of free fall and uniform speed to construct a physical model of the trajectory of a projectile, use the motion of a real projectile to test a physical model of projectile motion, and use a physical model of projectile motion to infer the effects of launch speed and launch angle on the range of a projectile.